Licensing and Noniterative Harmony in Lango

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Iterativity

- "Sour grapes": Typical Optimality Theoretic (OT; Prince & Smolensky 1993[2004]) constraints driving whole-word processes are unsuited for less comprehensive processes (Padgett 1995, McCarthy 2003, 2004):
  - Agree (Lombardi 1999, Baković 2000)
  - Align (McCarthy & Prince 1993, Kirchner 1993, Cole & Kisseberth 1995, Pulleyblank 1996)
  - Spread (Padgett 1997, Walker 2000), etc.
- Many rule-based theories (e.g. Jensen & Strong-Jensen 1976, Archangeli & Pulleyblank 1994): By turning an iterativity parameter off, analyses for whole-word processes can be used for shorter processes.

⇒ What does it mean to be (non)iterative? Is it a problem that OT can't unite iterative and noniterative phenomena under a single analysis?

- The OT approach is correct: there are no purely noniterative phenomena (Kaplan 2006).
- Vowel harmony: an apparent case of noniterative harmony is best analyzed as a product of Positional Licensing (Steriade 1994a,b, Zoll 1998a,b, Itô & Mester 1999, Crosswhite 2000), not standard harmony drivers.
- cf. Walker (2004): The harmonizing feature in Tudanca Spanish is attracted to stress.

Noniterative ATR Harmony in Lango

- Lango is a Nilotic language spoken in Uganda. (Data from Woock & Noonan (1979), Noonan (1992), Smolensky (2006))
- [+ATR] vowels: *i, e, u, o, ə* Their [–ATR] correspondents: *ɪ, ɛ, ʊ, ɔ, a*
- ATR spreads from roots to suffixes (prefixes don't harmonize):

(1) *Harmony with /-Ca/ '1sg inalienable'*

a.	/òpúk + Cá/	→ òpúkkə́	'my cat'	(cf. *dɛ̀kká* 'my stew')
b.	/píg + Cá/	→ píggə́	'my juice'	(cf. *ɔ̀ttá* 'my house')

(2) *Harmony with /-Co/ 'infinitive'*

a.	/lwɔk + Co/	→ lwɔkkɔ	'to wash'	(cf. *riŋŋo* 'to run')
b.	/lʊb + Co/	→ lʊbbɔ	'to follow'	(cf. *ketto* 'to put')

- Harmony is blocked under certain phonotactic conditions (see Appendix and Smolensky 2006):

(3)

a.	/twòl + ná/	→ twòllá	'my snake'
b.	/dɛ̀k + wú/	→ dɛ̀kwú	'your (pl) stew'
c.	/lɪm + Co/	→ lɪmmo	'to visit'
d.	/gwèn + ná/	→ gwènná	'my chicken'

- [+ATR] can spread regressively:

(4) *Harmony with /-ni/ '2sg possessive,' /-wú/ '2pl possessive'*

a.	/kɔ́m + ní/	→ kòmmí	'your chair'
b.	/dɛ̀k + ní/	→ dèkkí	'your stew'
c.	/ɲɪ̀ŋ + wú/	→ ɲɪ̀ŋwú	'your (pl) name'

- But [+ATR] only targets the root-final vowel:

(5)

a.	/bɔ̀ŋɔ́ + nɪ́/	→ bɔ̀ŋɔ́nɪ́	'your dress'	(*bɔ̀ŋɔ́nɪ́)
b.	/cɔ̀ŋɔ̀ + nɪ́/	→ cɔ̀ŋɔ̀nɪ́	'your beer'	(*cɔ̀ŋɔ̀nɪ́)
c.	/àmʊ́k + nɪ́/	→ àmúkkɪ́	'your shoe'	(*àmúkkɪ́)
d.	/dàktàl + ê/	→ dàktàlê	'doctors'	(*dàktàlê)
e.	/mɔ̀tɔ̀kà + ê/	→ mɔ̀tɔ̀kàê	'cars'	(*mɔ̀tɔ̀kàê)

- Noniterativity is epiphenomenal: It results from a Positional Licensing constraint that interacts with Faithfulness constraints to produce harmony that does minimal violence to the input.
- Reasons to be be suspicious of a harmony analysis:
  - Most roots are harmonic, but a few aren't (6).
  - Root-affix harmony creates disharmonic stems (5). It looks like root harmony is no longer active.

(6)

a.	cúpá	'bottle'
b.	òmín	'brother'

Positional Licensing

- AGREE, etc., can't account for (5):

(7) AGREE([±ATR]): Vowels in adjacent syllables must have the same value for [±ATR]. (Smolensky 2006)

(8)

	/bɔ̀ŋɔ́ + nɪ́/	AGREE	IDENT([±ATR])
(☞)	a. bɔ̀ŋɔ́nɪ́	*!	*
☠	b. bɔ̀ŋɔ́nɪ́		**
	c. bɔ̀ŋɔ́nɪ́	*!	

- No iterativity parameters in the OT constraints.
- Despite similarities, typical harmony and Lango have fundamentally different motivations.
- The iterativity parameter common among rule-based theories is misguided.

- Smolensky (2006) accounts for the direction and possibility of harmony, but not the noniterativity.
- Harmony is driven by Agree (7).
- Six other constraints block harmony and derive progressive/regressive harmony as appropriate; see Appendix.
  - In Tableaux below, Progressive Harmony and Regressive Harmony stand in for these constraints.
- Agree-based analysis can't account for (5).

- After assimilation, the suffix vowel shares its ATR feature with some root segment.

  ⇒ Roots are "prominent positions which license more contrasts than other non-prominent positions" (Urbanczyk 2006:194; see also Steriade 1995, Beckman 1999).

(9) LICENSE-[ATR]: [±ATR] features must be linked to root segments. (cf. Zoll 1998b, Crosswhite 2000; see also Walker 2004)

- I.e., a contrast based on [±ATR] is only permitted in roots.
- Spreading in either direction can be sufficient.

(10)

	/bɔ̀ŋɔ́ + nɪ́/	RegHarm	Lic-[ATR]	Ident([±ATR])
	a. bɔ̀ŋɔ́nɪ́		*!	
☞	b. bɔ̀ŋɔ́nɪ́			*
	c. bɔ̀ŋɔ́nɪ́			**!
	d. bɔ̀ŋɔ́nɪ́	*!		*

- A noniterative rule works just as well for this form.
- Polysyllabic suffixes:
  - Noniterative rule: Only first suffix vowel should harmonize.
  - Licensing: All suffix vowels must harmonize in order to be licensed.

(11)

a.	/cèg + ɛ́rɛ̂/ →	cègérê	'to be closed'
b.	/cul + mɛrɛ/ →	cullere	'penis (3sg alien)'
c.	/kùl + mɛ́rɛ̂/ →	kùllérê	'wart hog (3sg alien)'
d.	/gwôk + mɛ́rɛ̂/ →	gwôkkérê	'dog (3sg alien)'

– This is consistent with Licensing, but not a noniterative rule.

– Also: harmony isn't foot-bound. (Plus, stress is roughly root initial.)

(12)

	/cèg + ɛ́rɛ̂/	ProgHarm	Lic-[ATR]	Ident([±ATR])
	a. cègɛ́rɛ̂		*!(*)	
	b. cègérɛ̂		*!	*
☞	c. cègérê			**
	d. cɛ̀gɛ́rɛ̂	*!		*

- "Harmony" in Lango isn't simply noniterative spreading. It's spreading with a purpose, and the Licensing requirement is typically met after one "iteration" of spreading.

Alternatives

- Positional Faithfulness (Beckman 1999) can block harmony on initial Vs:

(13) IDENT[ATR]-[σ: Corresponding segments in root-initial syllables have identical values for [±ATR].

- Now monosyllabic roots can't be produced:

(14)

/pí + wú/ 'for you'	IDENT[ATR]-[σ	REGHARM	AGREE
☠ a. píwú			*
(☞) b. píwú	*!		
c. píwʊ́		*!	

- Positional Faithfulness predicts *mɔ̀tɔ̀kəê, not mɔ̀tɔ̀kəê 'cars' (5e).

- Noniterative tone spread/shift is common in tone.
- LOCAL (Myers 1997) limits tone shift to one syllable:

(15) LOCAL: "If an input tone T has an output correspondent T′, some edge of T must correspond to the edge of T′."

- But one edge of ATR's domain is the same in the input and output, regardless of the extent of spreading.
- Another version of LOCAL (Yip 2002):

(16) LOCAL: "An output tone cannot be linked to a TBU that is not adjacent to its [input] host."

- I.e., ATR spreading by one vowel in either direction is fine.
- This fails with polysllabic suffixes (11), e.g. *cègérê* 'to be closed': spreading by two syllables.
- Only Licensing permits flexibility in the size of the harmonizing domain.
- Positional Faithfulness and LOCAL too rigidly impose size requirements.

Conclusion

- Lango [±ATR] harmony holds between root-final and suffix vowels.
- A standard harmony rule turned noniterative seems appealing.
- A Licensing account within OT is superior.
- On close inspection, assimilation in Lango and typical harmony have distinct motivations.
- (Non)iterativity is epiphenomenal: different motivations, different analyses—not two sides of the same coin, as an iterativity parameter suggests. Our analyses need not mention (non)iterativity.
- Perhaps other apparently noniterative phenomena (e.g. umlaut and metaphony) have other driving or limiting factors such as attraction to prominence. (McCormick 1981, Chung 1983, Flemming 1994, Walker 2004, Kaplan 2006)

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Appendix

Summary of Constraints in Smolensky (2006); see original for formalizations.

$\mathbb{C}_1$: No [+ATR] spread from [-hi] source in closed σ.
$\mathbb{C}_2$: No regressive [+ATR] spread from a [-hi] source.
$\mathbb{C}_3$: No regressive [+ATR] spread from a [-front] V onto a [-hi] V in a closed σ.

} *regulate [+ATR] spread*

$\mathbb{C}_X$: No regressive [-ATR] spread.
$\mathbb{C}_Y$: No [-ATR] spread from a [+fr] vowel.
$\mathbb{C}_Z$: *[-ATR, +hi]

} *regulate [-ATR] spread*

- Ranking: $\mathbb{C}_1$, $\mathbb{C}_2$, $\mathbb{C}_3$, $\mathbb{C}_X$, $\mathbb{C}_Y$, $\mathbb{C}_Z \gg$ AGREE
  - ◇ [+ATR]-spreading candidates win if they don't violate $\mathbb{C}_1$, $\mathbb{C}_2$, $\mathbb{C}_3$.
  - ◇ [-ATR]-spreading candidates win if they don't violate $\mathbb{C}_X$, $\mathbb{C}_Y$, $\mathbb{C}_Z$.
  - ◇ Harmony is blocked if no harmonic candidate survives these constraints.